

## SDM025N03S

### 30V N-Channel MOSFETs

Rev A.0

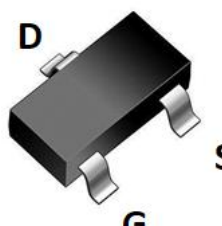
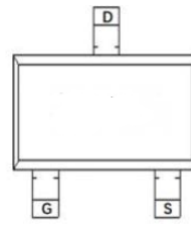
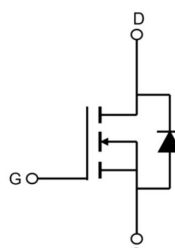
#### Feature

- ✧ Low  $R_{DS(ON)}$
- ✧ Low Gate Charge
- ✧ High current Capability
- ✧ Green product (RoHS compliant), lead free
- ✧ 100% UIS Tested

#### Product Summary

$V_{DS}$	30	V
$V_{GS(th\_Typ)}$	1.7	V
$R_{DS(ON\_Typ)}$ (at $V_{GS} = 10V$ )	18.4	m $\Omega$
$I_D$ (at $V_{GS} = 10V$ )	5.8	A

Type	Package	Marking	Outline	Media	Quantity (pcs)
SDM025N03S	SOT-23	3404	Tape	7" Reel	3000

 <p><b>SOT-23 top view</b></p>	 <p><b>Pin Assignment</b></p>	 <p><b>Schematic Diagram</b></p>
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#### Absolute Maximum Ratings (Rating at $T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Maximum	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	$T_A=25^\circ C$	5.8
		$T_A=100^\circ C$	4
Pulsed Drain Current <sup>(1)</sup>	$I_{DM}$	23	A
Maximum Body-Diode Continuous Current	$I_S$	5.8	A
Power Dissipation	$P_D$	1.1	W
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ C$

**Electrical Characteristics** (Rating at  $T_J=25^{\circ}\text{C}$  unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>STATIC PARAMETERS</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$I_D=250\mu\text{A}$ , $V_{GS}=0\text{V}$	30	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=30\text{V}$ , $V_{GS}=0\text{V}$	-	-	1	$\mu\text{A}$
$I_{GSS}$	Gate-Body Leakage Current	$V_{DS}=0\text{V}$ , $V_{GS}=\pm 20\text{V}$	-	-	$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$	1.2	1.7	2.2	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>(3)</sup>	$V_{GS}=10\text{V}$ , $I_D=5.5\text{A}$	-	18.4	24	m $\Omega$
		$V_{GS}=4.5\text{V}$ , $I_D=4.5\text{A}$	-	25.5	33	
$V_{SD}$	Diode Forward Voltage	$I_S=5.8\text{A}$ , $V_{GS}=0\text{V}$	-	-	1.2	V
<b>DYNAMIC PARAMETERS</b>						
$C_{iss}$	Input Capacitance	$V_{GS}=0\text{V}$ , $V_{DS}=15\text{V}$ , $f=1\text{MHz}$	-	487	-	pF
$C_{oss}$	Output Capacitance		-	71	-	pF
$C_{rss}$	Reverse Transfer Capacitance		-	55	-	pF
<b>SWITCHING PARAMETERS</b>						
$Q_g$	Total Gate Charge	$V_{GS}=0$ to $10\text{V}$ , $V_{DS}=15\text{V}$ , $I_D=5\text{A}$	-	11	-	nC
$Q_{gs}$	Gate Source Charge		-	3	-	nC
$Q_{gd}$	Gate Drain Charge		-	3	-	nC
$t_{D(on)}$	Turn-On Delay Time	$V_{GS}=10\text{V}$ , $V_{DS}=15\text{V}$ , $I_D=5\text{A}$ , $R_{GEN}=3\Omega$	-	5	-	ns
$t_r$	Turn-On Rise Time		-	13	-	ns
$t_{D(off)}$	Turn-Off Delay Time		-	15	-	ns
$t_f$	Turn-Off Fall Time		-	3	-	ns
$t_{rr}$	Body Diode Reverse Recovery Time	$I_F=5\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$	-	7.7	-	ns
$Q_{rr}$	Body Diode Reverse Recovery Charge	$I_F=5\text{A}$ , $di/dt=100\text{A}/\mu\text{s}$	-	3	-	nC

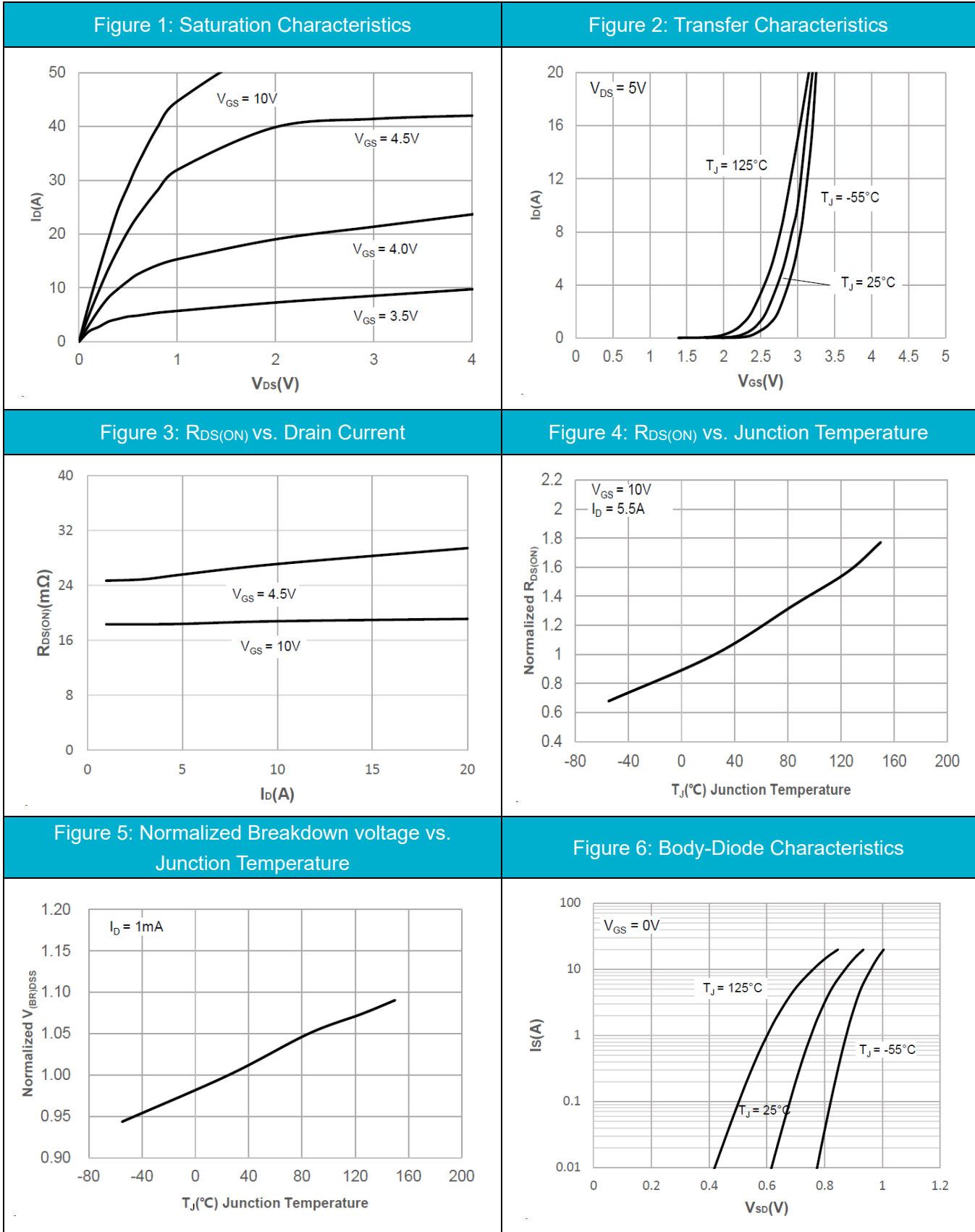
**Thermal Resistances**

Symbol	Parameter	Typ	Max	Unit
R <sub>θJA</sub>	Thermal resistance from junction to Ambient <sup>(2)</sup>	-	113	°C /W

**Notes:**

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. R<sub>θJA</sub> is measured with the device mounted on a 1inch<sup>2</sup> pad of 2oz copper FR4 PCB
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 0.5%.

Typical Electrical and Thermal Characteristics



Typical Electrical and Thermal Characteristics

Figure 7: Gate-Charge characteristics

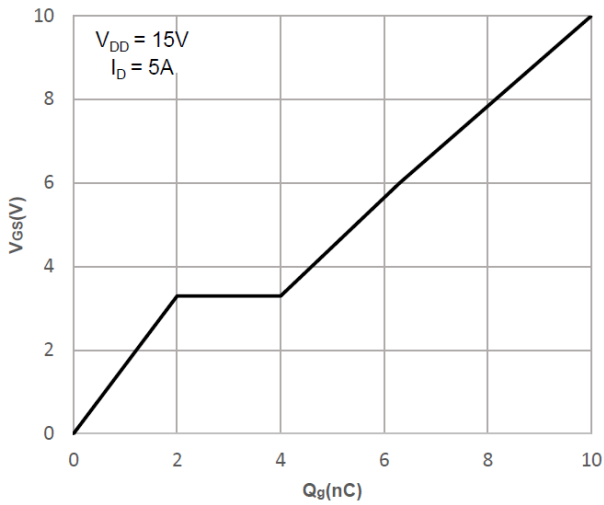


Figure 8: Capacitance characteristics

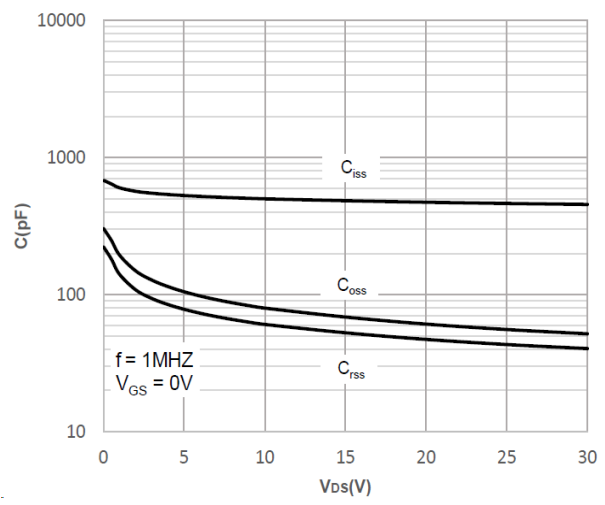


Figure 9: Current De-rating

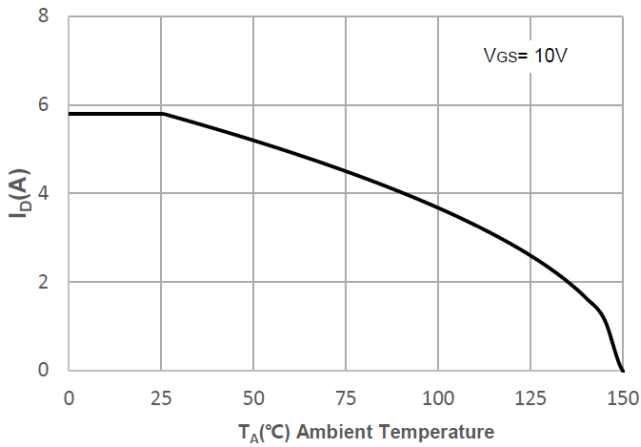


Figure 10: Maximum Safe Operating Area

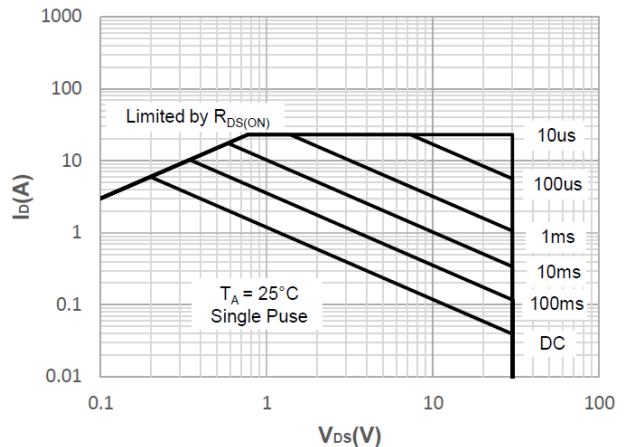


Figure 11: Peak Current Capacity

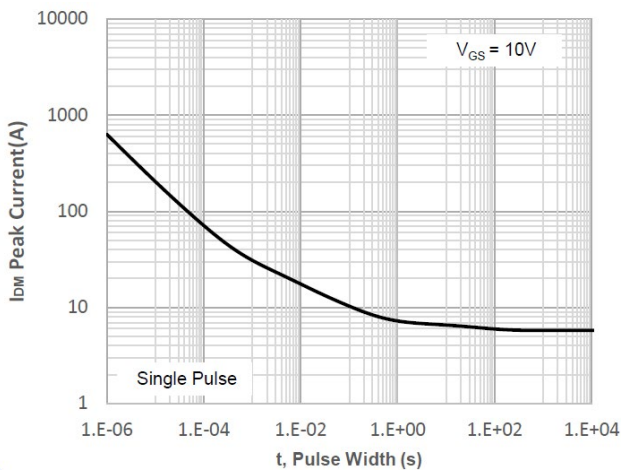
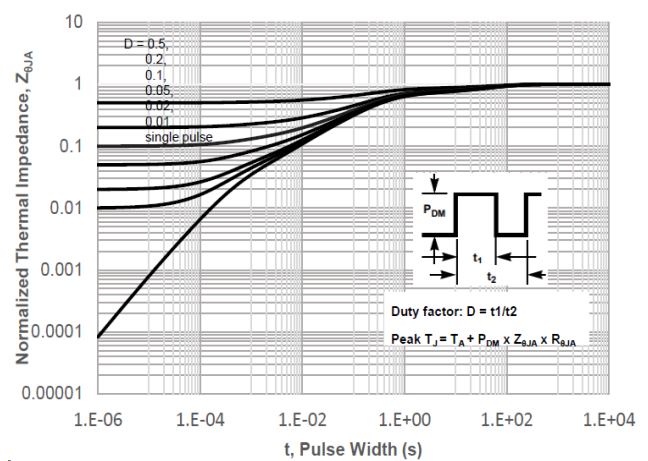


Figure 12: Normalized Maximum Transient Thermal Impedance



Test Circuit

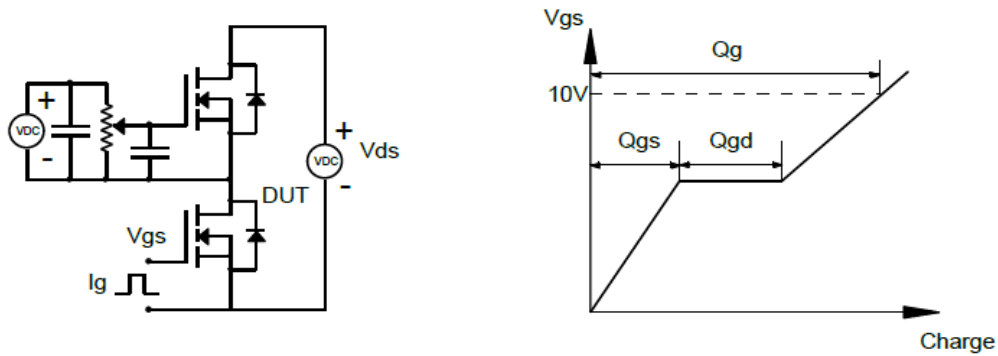


Figure1: Gate Charge Test Circuit & Waveforms

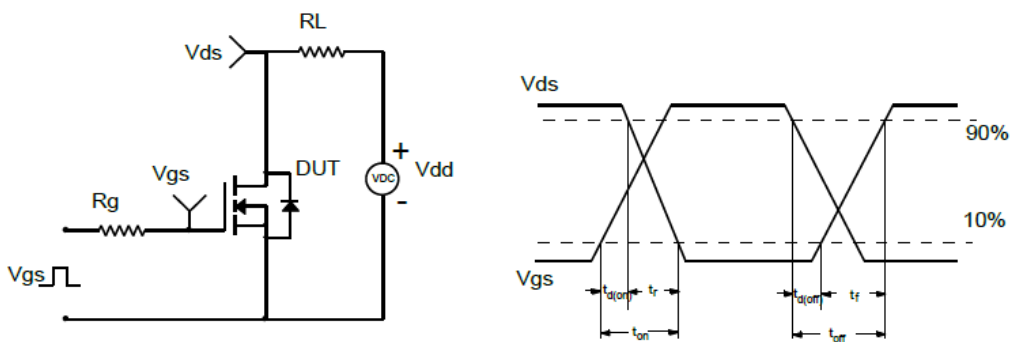


Figure2: Resistive Switching Test Circuit & Waveforms

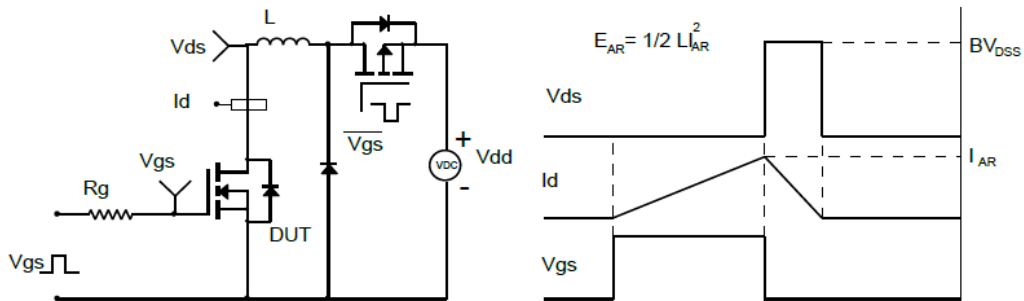


Figure3: Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

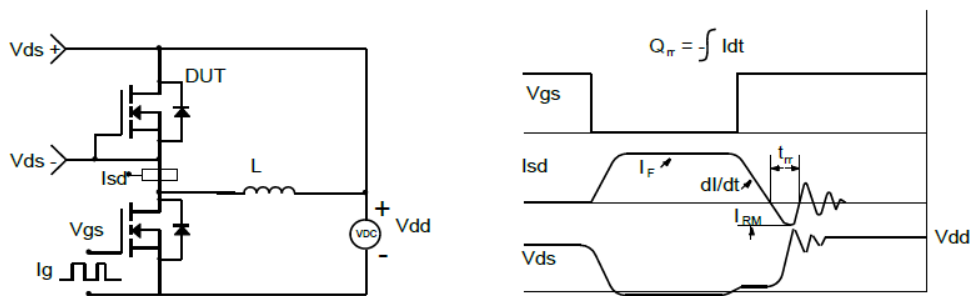
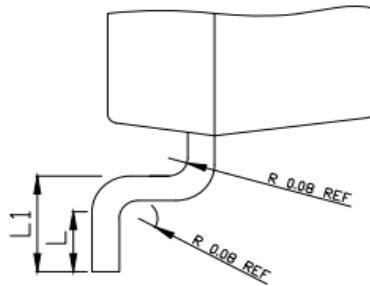
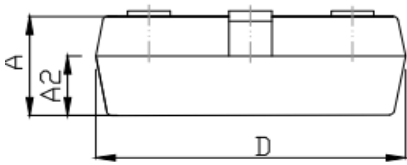
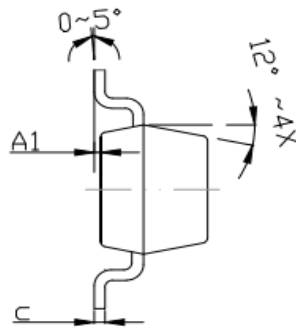
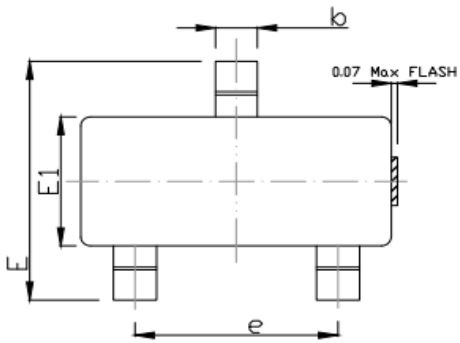


Figure4: Diode Recovery Test Circuit & Waveforms

# SDM025N03S

## SOT-23 Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.95	1.00	1.05
A1	0.01	0.05	0.10
b	0.35	0.40	0.45
c	0.11 BSC		
D	2.80	2.90	3.00
E	2.30	2.40	2.50
E1	1.20	1.30	1.40
e	1.90 BSC		
L	0.20	-	-
L1	0.30	0.40	0.50
A2	0.60 REF		

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